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EXAMINER	
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ART UNIT	**PAPER NUMBER**
4192	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,010	TUBARO ET AL.	
	Examiner	Art Unit	
	ABDERRAHIM MEROUAN	4192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/29/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/08/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 2-5 are objected to because of the following informalities. They contain:" Characterized in that" , which does not follow standard US practice. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8,9 and 15 to 20 are rejected under 35 U. S. C. 101 because the claimed invention is directed to non-statutory subject matter as follows. The claims contain:" Program for computer comprising a program code….." is non-statutory for at least the reason that is not tangibly embodied in a manner so as to be executable.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 to 4, 6, 8 to 9, and 15 to 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bittner et Al (Exact Regional Visibility using Line) hereinafter referred as Bittner.

3. As per claim 1 Bittner teaches:

Method for determining the region of visibility between at least a first reflector and a second reflector comprising the following phases:

representing said first and second reflector(Bittner , page 8, Figure 9 (a)) in a system of coordinates (x, y, z);(Bittner , page 4, Lines passing through a point, line 5)
said method is characterized in that it comprises the further phases of:
carrying out an affine transformation of said system of coordinates (x, y, z); (Bittner , page 3, Plucker coordinates of lines, lines 1 to 15)

determining the region of visibility of said second reflector in relation to said first reflector as the set of the parameters of the straight lines that link a generic point of said first reflector with a generic point of said second reflector. (Bittner, page 6, Lines passing through a set of line segments, Figure 6 (a) and (b))

4. As per claim 2 Bittner teaches: Method in accordance with claim 1, claim 2 adds into claim 1:

characterized in that said affine transformation comprises the execution of a rotatory-translation of said system of coordinates (x,y, z) so that said first reflector is placed on the plane x = 0. (Bittner, page 4, Plucker coordinates of lines, Figure 2 (a) , (b), and (c))

5. As per claim 3 Bittner teaches: Method in accordance with claim 1, claim 3 adds into claim 1:

characterised in that said affine transformation comprises the execution of a scaling down of said system of coordinates (x, y, z) so that said first reflector assumes preset dimension. (Bittner, page 10, Results, lines 24 to 42, Figure 12-(b))

6. As per claim 4 Bittner teaches: Method in accordance with claim 1, claim 4 adds into claim 1:

characterized in that it comprises a third reflector; and the following phases:
determining the region of visibility of said second and third reflector seen from said first reflector; (Bittner, page 8,Fast regional visibility test, lines 1 to 6, Figure 10 (a), and (b))

in the case that there are overlapped regions of visibility tracing a semistraight line in said system of coordinates whose parameters are comprised in the overlapping region starting from said first reflector; (Bittner, page 7, Visibility from a region, lines 1 to 5, Figure 8 (a) , (b), and (c))

determining What is the succession of the intersections between said second and third reflector; (Bittner, page 5,Figure 4 (a), and (b))

assigning the portion of overlapped region of the region of visibility to the reflector having priority succession order; (Bittner, page 5, Lines passing through a set of line segments, right column, lines 15 to 21)

said regions of visibility represent a visibility diagram. (Bittner, page 8,Figure 9 (a), and (b))

7. As per claim 6 Bittner teaches: Method in accordance with claim 1, claim 6 adds into claim 1:

Method for determining a beam tree of beams of rays on a plurality of reflectors comprising the phases of previously determining the set of the region of visibility from each reflector (Bittner, page 6,Figure 7 (a), and (b))

8. As per claim 8 Bittner teaches: claim 8 adds to claim 1:

Program for computer comprising a program code that carries out all the phases of claim 1 when said program is executed on said computer. (Bittner, page 10, right column , lines 2 to 15)

9. As per claim 9 Bittner teaches: claim 9 adds to claim 1:

Program for computer recorded on a support that can be used by said computer for controlling the execution of all the phases of claim 1. (Bittner, page 10, right column , lines 11 to 13)

10. Arguments used to reject 15 are analogous to arguments used to reject claim 8.

11. Arguments used to reject 16 are analogous to arguments used to reject claim 8.

12. Arguments used to reject 17 are analogous to arguments used to reject claim 8.

13. Arguments used to reject 19 are analogous to arguments used to reject claim 8.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 5, 7, 10 to 14, and 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foco et al (sound specialization based on fast beam tracing in the dual space) hereinafter referred as Foco, in view of Bittner et al (Exact Regional Visibility using Line) as applied above, hereinafter referred as Gerard.

As per claim 5 Bittner teaches: Method in accordance with claim 1 characterized by:

Bittner doesn't teach:

representing said first reflector and second reflector in a system of coordinates (x, y) by means of segments;

executing an affine transformation of said system of coordinates (x, y) capable of leading said first reflector to assume coordinates of the extremes in the points(O, m) and (0, n) with $m < n$;

representing said second reflector by means of the following system of equations
x=andt+f
y=gt+h with 0 <= t <= 1

representing a generic straight line by means of the parameters a, b of the equation y = ax+b;

determining the region of visibility determining all the straight lines that pass through a generic point of the first and of the second reflector combining the previous equations and obtaining the following system
gt+h=a(et+f)+b ,with 0<= t<= 1 and with m <= b <= n.

Foco teaches:

representing said first reflector and second reflector in a system of coordinates (x, y) by means of segments; (Foco, page 1,right column, lines 1 to 5, Figure 1)

executing an affine transformation of said system of coordinates (x, y) capable of leading said first reflector to assume coordinates of the extremes in the points(O, m) and (0, n) with m < n; (Foco, page 2,right column, lines 4 to 8, Figure 3b)

representing said second reflector by means of the following system of equations
x=andt+f
y=gt+h with 0 <= t <= 1 (Foco, page 1,right column, lines 8 to 9)

representing a generic straight line by means of the parameters a, b of the equation y = ax+b; (Foco, page 1,right column, line 9)

determining the region of visibility determining all the straight lines that pass through a generic point of the first and of the second reflector combining the previous equations and obtaining the following system
gt+h=a(et+f)+b, with 0<= t<= 1 and with m <= b <= n. (Foco, page 2,right column, Figure 3c)

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Foco into Bittner since Bittner did not describe the geometric transformation in the dual space , and Foco suggests the beneficial use the affine transformation for achieving a computational efficiency.

17. As per claim 7 Bittner teaches: Method for determining a beam tree of beams of rays on a plurality of reflectors comprising the phases of previously determining the visibility diagram in accordance with claim 1

Bittner doesn't teach:

positioning a source in a system of coordinates (x, y);

determining in said system of coordinates (x, y) the areas of the reflectors illuminated by said source;

memorizing the coordinates of said areas of the reflectors illuminated by said source;

representing a virtual source for each reflector illuminated;

applying said affine transformation of said system of coordinates (x, y) to said virtual source and to said illuminated region;

said illuminated transformed region is represented by means of a segment of extremes (0,b0) and (0, b1);

representing said virtual source transformed in the space of the parameters (a, b) by means of the equation y = a x + b, and the illuminated region by means of the disequation b0 <= b<= b1

the system of equations y = a x + b and b0 <=b<= bl represents a segment of illumination in the space of the parameters (a, b);

intersecting said segment of illumination with said visibility diagram obtaining sub-segments and thus sub-intervals of the interval b0<= b<= bl;

said sub-intervals will represent portions of the illuminated region that will each illuminate a new reflector.

Foco teaches:

positioning a source in a system of coordinates (x, y); (Foco, page 1,right column, lines 16 to 17)

determining in said system of coordinates (x, y) the areas of the reflectors illuminated by said source; (Foco, page 1,right column, lines 18 to 21)

memorizing the coordinates of said areas of the reflectors illuminated by said source; (Foco, page 2,left column, lines 1 to 6)

representing a virtual source for each reflector illuminated; (Foco, page 2,left column, Figure 2b)

applying said affine transformation of said system of coordinates (x, y) to said virtual source and to said illuminated region; (Foco, page 2,left column, lines 6 to 17)
said illuminated transformed region is represented by means of a segment of extremes (0,b0) and (0, b1); (Foco, page 2,right column, lines 6 to 8)

representing said virtual source transformed in the space of the parameters (a, b) by means of the equation y = a x + b, (Foco, page 2, left column, lines 8 to 10) and the illuminated region by means of the disequation b0 <= b<= b1(Foco, page 2, right column, Figure 3c)

the system of equations y = a x + b and b0 <=b<= bl represents a segment of illumination in the space of the parameters (a, b); (Foco, page 1, right column, lines 14 to 21)

intersecting said segment of illumination with said visibility diagram obtaining sub-segments and thus sub-intervals of the interval b0<= b<= bl; (Foco, page 3, left column, lines 24 to 27)

said sub-intervals will represent portions of the illuminated region that will each illuminate a new reflector. (Foco, page 2, right column, lines 13 to 16)

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the teachings of Foco into Bittner since Bittner did not describe the geometric transformation in the dual space , and Foco suggests the beneficial use the affine transformation for achieving a computational efficiency.

18. Arguments used to reject 10 are analogous to arguments used to reject claim 7.

19. Arguments used to reject 11 are analogous to arguments used to reject claim 7.

20. Arguments used to reject 12 are analogous to arguments used to reject claim 7.

21. Arguments used to reject 13 are analogous to arguments used to reject claim 7.

22. Arguments used to reject 14 are analogous to arguments used to reject claim 7.

23. Arguments used to reject 18 are analogous to arguments used to reject claim 5 and claim 8

24. Arguments used to reject 20 are analogous to arguments used to reject claim 7 and claim 8

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDERRAHIM MEROUAN whose telephone number is (571)270-5254. The examiner can normally be reached on Monday to Friday 7:30 AM to 5:00 PM.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on (571) 272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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